

CLAIM AMENDMENTS

1-28 (canceled)

29. (currently amended) A method for the removal of copper from a concentrated chloride-containing zinc sulphate solution known as raw solution that is going to an electrolytic preparation of zinc, using an ion exchanger, comprising:

routing at least some of the raw solution to an ion exchange stage for copper removal, wherein the copper removal takes place using a chelating alkyl-silylated silica-based ion exchanger, of which ~~the~~ a functional group is a polymeric amine, and

routing the solution from which the copper has been removed to a subsequent stage of solution purification.

30. (currently amended) A method according to claim 29, wherein the ion exchange stage comprises an alkaline pretreatment of the ion exchanger, treatment with ~~dilute a~~ a copper-free zinc sulphate solution, solution containing less than 30 g Zn/l the copper removal, regeneration of the ion exchanger and separation of copper from the regeneration solution.

31. (previously presented) A method according to claim 29, wherein the zinc content of the raw solution is in the range of 30 - 200 g/l.

32. (previously presented) A method according to claim 29, wherein the copper content of the raw solution routed to the ion exchange stage is in the range of 100 - 2000 mg/l.

33. (previously presented) A method according to claim 30, wherein the treatment of the ion exchanger occurs with copper-free zinc sulphate solution, which has a pH of at least 2.

34. (previously presented) A method according to claim 30, wherein the copper removal with ion exchanger occurs at a pH of over 3.5.

35. (previously presented) A method according to claim 34, wherein the copper removal with an ion exchanger occurs at a pH of 3.7 - 4.2.

36. (previously presented) A method according to claim 30, wherein the copper separation from the regeneration solution is carried out as sulphide precipitation.

37. (previously presented) A method according to claim 29, wherein the polymeric amine acting as the functional group of the ion exchanger is a polyethylene imine.

38. (previously presented) A method according to claim 29, wherein before copper removal with an ion exchanger at least some of the raw solution is routed to a chloride removal stage.

39. (previously presented) A method according to claim 38, wherein before chloride removal the raw solution is cooled to a temperature of maximum 45°C.

40. (previously presented) A method according to claim 38, wherein before chloride removal the pH of the raw solution is adjusted to the range of 1.5 - 3.9.

41. (currently amended) A method according to claim 38, wherein chloride removal is performed using ~~copper (I)-oxide,~~
~~euprous oxide,~~ cuprous oxide so that the chloride in the solution is precipitated as copper chloride.

42. (previously presented) A method according to claim 41, wherein copper chloride is separated from the solution and

converted with alkali back to cuprous oxide, which is at least partially routed back to chloride removal.

43. (currently amended) A method according to claim 38, wherein part of the raw solution is routed to cuprous oxide precipitation, where the copper in the solution is made to react with zinc powder to form cuprous oxide, and the ~~Cu₂O~~ cuprous oxide generated is routed to the chloride removal stage.

44. (previously presented) A method according to claim 38, wherein the copper content of solution routed from the chloride removal stage to copper removal is in the range of 500 - 5000 mg/l.

45. (currently amended) A method for the removal of copper and chloride from a chloride-containing concentrated zinc sulphate solution, or raw solution, going to an electrolytic preparation of zinc, comprising:

routing at least some of the raw solution to cooling, where the solution is cooled to a temperature of 30 - 45°C and the pH is adjusted to the range 1.5 - 3.9,

subsequently routing the cooled solution to chloride removal, which is performed with ~~copper (I) oxide, Cu₂O,~~ cuprous oxide whereby the chloride in the solution is precipitated as copper chloride;

separating the copper chloride from the solution

routing the solution at least partially to an ion exchange step for copper removal, wherein the copper removal occurs using a chelating alkyl-silylated silica-based ion exchanger, of which a polymeric amine acts as a functional group, and where the ion exchange step comprises an alkaline pretreatment of the ion exchanger, treatment with copper-free zinc sulphate solution, copper removal, a regeneration of the ion exchanger and a separation of copper from the regeneration solution, and

routing the solution from which chloride and copper have been removed to a following stage of solution purification.

46. (previously presented) A method according to claim 45, wherein the copper chloride is separated from the solution and converted using an alkali back to cuprous oxide, which is at least partially routed back to chloride removal.

47. (currently amended) A method according to claim 45, wherein some of the raw solution is routed to cuprous oxide precipitation, where the copper in the solution is made to react with zinc powder to form cuprous oxide, and the ~~Cu₂O~~ cuprous oxide generated is routed to the chloride removal stage.

48. (previously presented) A method according to claim 45, wherein the zinc content of the raw solution is in the range of 30 - 200 g/l.

49. (previously presented) A method according to claim 45, wherein the copper content of the solution routed to the ion exchange step is in the range of 500 - 5000 mg/l.

50. (previously presented) A method according to claim 45, wherein the treatment of the ion exchanger occurs with copper-free zinc sulphate solution, which has a pH of at least 2.

51. (previously presented) A method according to claim 45, wherein the copper removal with an ion exchanger occurs at a pH value of over 3.5.

52. (previously presented) A method according to claim 51, wherein the copper removal with an ion exchanger occurs at a pH value of 3.7 - 4.2.

53. (previously presented) A method according to claim 45, wherein the copper separation from the regeneration solution is carried out as sulphide precipitation.

54. (previously presented) A method according to claim 45, wherein the polymeric amine acting as the functional group of the ion exchanger is a polyethylene imine.